

PASSAIC COUNTY TECHNICAL INSTITUTE

ALGEBRA I HONORS

July 2011

I. COURSE DESCRIPTION

The Algebra honors curriculum is design for academically motivated students who are proficient in mathematics. This course takes a different approach than the standard Algebra 1 course, requiring students to perform at a high level of abstraction. There will be substantially more rigorous questions, mathematical analysis, projects, and real-life problems. This course should bring students to a high level of confidence in their ability to derive and effectively use some of the most fundamental relationships of mathematics. Student's GPA for this course is calculated as 1 point more than a regular course.

Algebra is the language through which much of mathematics is communicated. Therefore, it is essential for students to master the fundamentals of Algebra I to be able to understand and study higher level mathematics, and to better understand their world through mathematics. Problem solving in Algebra I enhances the students' understanding of the effective use of mathematics in the workplace and their everyday lives.

Algebra I begins the four-year sequence of college preparatory mathematics. This course is designed for students who have strong and workable foundation in basic mathematic skills. Through this course, students will experience a study of operations on the Real Number System, solving first and second-degree equations, problem solving techniques involving Real World situations, graphing linear equations on the coordinate plane, working with exponents, and data analysis which includes probability and statistical theory. The basic mathematical knowledge required to pass the Algebra I exit exam as well as other standardized tests are reinforced through algebraic application.

The graphing calculator provides a tool for supplementing the traditional focus on algebraic procedures. It provides a hand on approach to solving equations and reinforces interpretation of graphs by incorporating visuals. This allows students to focus on understanding the relationship between the equation(s) and the graph, and what the graph represents in a real-life situation.

II. COURSE OBJECTIVES/OUTLINE

Note to Teachers:

1. Utilize the **graphing calculator** for the topics that the textbook as an extra tool.
2. Review topics should be completed by the end of the 1st week of the new school year.

Review

1. Diagnostic assessment
2. Integer Rules, Combining Like terms and Distributive Property

I. EXPRESSIONS, EQUATIONS, AND FUNCTIONS (Chapter 1.1-8)

1. Evaluate Expressions (N.Q.1)
2. Apply Order of Operations (A.SSE.1)
3. Write Expressions (A.SSE.1)
4. Write Equations and Inequalities (A.CED.1)
5. Use Problem Solving Plan (A.CED.1)
6. Use Precision and Measurement (N.Q.3)
7. Represent Functions as Rules and Tables (A.CED.2)
8. Represent Functions as Graphs (F.IF.4)

II. SOLVING LINEAR EQUATIONS (Chapter 2.1-8)

1. Find Square Roots and Compare Real Numbers (N.Q.1)
2. Solve One-Step Equations (A.REI.3)
3. Solve Two-Step Equations (A.REI.3)
4. Solve Multi-Step Equations (A.REI.3)
5. Solve Equations With Variables on Both Sides (A.REI.3)
6. Write Ratios and Proportions (A.CED.1)
7. Solve Proportions Using Cross Products (A.CED.1)
8. Rewrite Equations and Formulas (A.CED.4)

III. PROBABILITY (Chapter 11.1-3)

1. Find Probabilities and Odds (S.CP.1)
2. Find Probabilities Using Permutations (S.CP.9)
3. Find Probabilities using Combinations (S.CP.9)

End of Marking Period One

IV. SOLVING AND GRAPHING LINEAR INEQUALITIES (Chapter 5.1-6)

1. Solve Inequalities Using Addition and Subtraction (A.REI.3)
2. Solve Inequalities Using Multiplication and Division (A.REI.3)

- 3. Solve Multi-Step Inequalities (A.REI.3)
- 4. Solve Compound Inequalities (A.REI.3)
- 5. Solve Absolute Value Equations (A.CED.1)
- 6. Solve Absolute Value Inequalities (A.CED.1)

V. GRAPHING LINEAR EQUATIONS AND FUNCTIONS (Chapter 3.1-5.7)

- 1. Plot Points in a Coordinate Plane (F.IF.7)
- 2. Graph Linear Equations (F.IF.7)
- 3. Graph Using Intercepts (F.IF.7)
- 4. Find Slope and Rate of Change (F.IF.6)
- 5. Graph Using Slope-Intercept Form (F.IF.7a)
- 6. Graph Linear Functions (F.IF.7a)

VI. SOLVING AND GRAPHING LINEAR INEQUALITIES (Chapter 5.7)

- 1. Graph Linear Inequalities in Two Variables (A.REI.12)

VII. PROBABILITY (Chapter 11.4-5)

- 1. Find Probabilities of Disjoin and Overlapping Events (S.CP.1)
- 2. Find Probabilities of Independent and Dependent Events (S.CP.2)

End of Marking Period Two

VIII. WRITING LINEAR EQUATIONS (Chapter 4.1-7)

- 1. Write Linear Equations in Slope-Intercept Form (A.CED.2)
- 2. Use Linear Equations in Slope-Intercept Form (A.CED.2)
- 3. Write Linear Equations in Point-Slope Form (A.CED.2)
- 4. Write Linear Equations in Standard Form (A.CED.2)
- 5. Write Equations of Parallel and Perpendicular Lines (F.LE.2)
- 6. Fit a Line to Data (S.ID.6c)
- 7. Predict With Linear Models (S.ID.6a)

IV. SYSTEMS OF EQUATIONS AND INEQUALITIES (Chapter 6.1-6)

- 1. Solve Linear Systems by Graphing (A.REI.6)
- 2. Solve Linear Systems by Substitution (A.REI.6)
- 3. Solve Linear Systems by Adding or Subtracting (A.REI.6)
- 4. Solve Linear Systems by Multiplying First (A.REI.6)
- 5. Solve Special Types of Linear Systems (A.REI.6)
- 6. Solve systems of Linear Inequalities (A.REI.12)

X. EXPONENTS AND EXPONENTIAL FUNCTIONS (Chapter 7.1-3)

1. Apply Exponent Properties Involving Products (A.SSE.3c)
2. Apply Exponent Properties Involving Quotients (ASSE.3c)
3. Define and Use Zero and Negative Exponents (F.LE.5)

End of Marking Period Three

XI. EXPONENTS AND EXPONENTIAL FUNCTIONS (Chapter 7.4-5)

1. Write and Graph Exponential Growth Functions (A.SSE.3c)
2. Write and Graph Exponential Decay Functions (A.CED.2)

XII. DATA ANALYSIS (Chapter 10.1-5)

1. Analyze Surveys and Samples (S.IC.1)
2. Use Measures of Central Tendency and Dispersion (S.ID.2)
3. Analyze Data (S.ID.5)
4. Interpret Stem-and-Leaf Plots and Histograms (S.ID.1)
5. Interpret Box-and-Whisker Plots (S.ID.1)

XIII. POLYNOMIALS AND FACTORING (Chapter 8.1-8)

1. Add and Subtract Polynomials (A.APR.1)
2. Multiply Polynomials (A.APR.1)
3. Find Special Products of Polynomials (A.APR.1)
4. Solve polynomial Equations in Factored Form (A.REI.4b)
5. Factor $x^2 + bx + c$ (A.SSE.3a)
6. Factor $ax^2 + bx + c$ (A.SSE.3a)
7. Factor Special Products (A.SSE.3a)
8. Factor Polynomials completely (A.SSE.3a)

XIV. QUADRATIC EQUATIONS AND FUNCTIONS (Chapter 9.1-3)

1. Graphing $y = ax^2 + c$ (F.BF.3)
2. Graphing $y = ax^2 + bx + c$ (F.IF.7a)
3. Solve Quadratic Equations by Graphing (F.IF.7a)

End of Marking Period Four

III. METHODS OF EVALUATION

The student will be evaluated using the following criteria:

1. Test
2. Quizzes
3. Homework
4. Class participation
5. Notebook
6. Projects

IV. TEXTBOOKS, INSTRUCTIONAL, RESOURCE & SOFTWARE MATERIALS

Student Textbook: Algebra I, Holt McDougal
Larson, Boswell, Kanold, Stiff
ISBN 978-0-547-64713-5
© 2012 by Houghton Mifflin Harcourt Publishing Company

Resource Materials: Algebra I, Holt McDougal TEACHER'S EDITION
Larson, Boswell, Kanold, Stiff
ISBN 0-618-37421-3
© 2012 by Houghton Mifflin Harcourt Publishing Company

Chapter Resource Books
© 2012 by Houghton Mifflin Harcourt Publishing Company

Worked-Out Solution Key
© 2012 by Houghton Mifflin Harcourt Publishing Company

Warm-Up Transparencies and Daily Homework Quiz
© 2012 by Houghton Mifflin Harcourt Publishing Company

Standardized Test Practice Workbook
© 2012 by Houghton Mifflin Harcourt Publishing Company

New Jersey Standards Test Preparations and Practice Workbook
© 2012 by Houghton Mifflin Harcourt Publishing Company

Software: Texas TI-83 or TI-84 or TI-Nspire Graphing Calculator
TI Navigator
Ron Larson Test Generator (CD)

Internet: <http://www.thefutureschannel.com/algebra>
<http://www.AlgebraNotes.com>
<http://www.brainpop.com>
<http://www.kutasoftware.com>
<http://www.classzone.com>

V. INSTRUCTIONAL STRATEGIES

Various teaching methods are used in this course. These include lecture, discovery-based activities, discussions, cooperative learning, small group/individual instruction and demonstrations. Technology is used to enhance daily lessons. Technology includes graphing calculators, PowerPoint presentations, overhead projectors, smart board, Elmo and any other software used to augment the effectiveness of the lesson. Vocabulary words and word problems will be infuse within each lesson. An understanding of math terms is crucial to students' ability to understand and execute math problems. In order to support students' comprehension of math terms, vocabulary instruction practices are useful. In particular, instruction of math terms and vocabulary will include:

- Discussion and repeated exposure to the conceptual base of each term
- Active exploration of examples for each term
- Active exploration of the differences between terms

ALGEBRA I HONORS

COURSE OVERVIEW

Algebra I begins the four-year sequence of college preparatory mathematics. This course is designed for the student who has a strong and workable foundation in the basic skills. Through this course, the student experiences a study of operations on the Real System, solving first and second-degree equations, problem solving techniques involving Real World situations, graphing linear equations and functions on the coordinate plane, working with exponents, and data analysis that includes probability and statistical theory. The basic mathematical knowledge required to pass the Algebra I exit exam as well as other standardized tests are reinforced through algebraic application.

PROFICIENCIES

Upon successful completion of the requirements of this course, the student will be able to:

- 1) Evaluate Expressions
- 2) Apply order of Operations
- 3) Write Expressions, Equations and Inequalities
- 4) Use Problem Solving Plan, Precision and Measurement
- 5) Represent Functions as Rules, Tables, and Graphs
- 6) Find Square Roots and Compare Real Numbers
- 7) Solve One-, Two-, and Multi-Step Equations
- 8) Write Ratios and Proportions
- 9) Solve Proportions Using Cross Products
- 10) Rewrite Equations and Formulas
- 11) Graph Linear Equations and Functions
- 12) Find Slope and Rate of Change
- 13) Write Linear Equations
- 14) Solve and Graph Linear Inequalities
- 15) Solve Systems of Equations and Inequalities
- 16) Apply Exponent Properties Involving, Products, Quotients, Zero, and Negative Exponents
- 17) Add, Subtract, and Multiply Polynomials including finding Special Products of Polynomials
- 18) Factor and Solve Polynomials
- 19) Graph and Solve Quadratic Equations and Functions
- 20) Model Linear and Non-Linear Equations and Functions Relationships
- 21) Analyze Data using Surveys, Samples, Measures of Central Tendency and Dispersion
- 22) Find Probabilities Using Permutations, Combinations, Odds, Independent, Dependent Events